

REMARKS

Entry of the foregoing amendments is respectfully requested.

Summary of Amendments

Upon entry of the foregoing amendments, claims 11-43 are cancelled and claims 44-76 are added, whereby claims 44-76 will be pending, with claims 44 and 56 being independent claims.

Support for the new claims can be found throughout the present specification (see, e.g., pages 4, 15 and 17) and in the cancelled claims.

Applicants emphasize that the cancellation of claims 11-43 is without prejudice or disclaimer, and Applicants expressly reserve the right to prosecute the cancelled claims in one or more continuation and/or divisional applications.

Summary of Office Action

As an initial matter, Applicants note with appreciation that the Office Action indicates that the claim for priority is acknowledged and that a certified copy of the priority document has been received by the Patent and Trademark Office from the International Bureau.

Applicants also note with appreciation that the Examiner has indicated consideration of the Information Disclosure Statement filed February 5, 2007.

The restriction requirement is made final and claims 11-29 are withdrawn from consideration.

Claims 30-43 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which Applicants

regard as the invention.

Claims 30-32, 35-37 and 39-43 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Mennig et al., U.S. Patent No. 6,162,498 (hereafter "MENNIG") in view of Hench et al., U.S. Patent No. 4,851,150 (hereafter "HENCH").

Claims 33 and 34 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of HENCH and further in view of the content from <http://web.archive.org/web/20020427181641/http://www.Mcgillairpressure.com/vac/textdocs/aboutus.html> (hereafter "McGILL").

Claim 38 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of HENCH and further in view of Chou et al., "Sol-Gel-Derived Hybrid Coatings for Corrosion Protection" in J. Sol-Gel Sci. and Tech. 26, pp. 321-327, 2003 (hereafter "CHOU").

Response to Office Action

Reconsideration and withdrawal of the objection and rejections of record are respectfully requested, in view of the foregoing amendments and the following remarks.

Response to Rejection under 35 U.S.C. § 112, Second Paragraph

Claims 30-43, i.e., all claims under consideration, are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The rejection alleges that the term "deformable" in independent claim 30 is a relative term which renders this claim indefinite.

Applicants respectfully disagree with the Examiner in this regard. At any rate, the rejected claims are cancelled and the claims submitted herewith do not recite the term “deformable”, whereby this rejection is moot.

Response to Rejections under 35 U.S.C. § 103(a) over MENNIG in View of HENCH

Claims 30-32, 35-37 and 39-43 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of HENCH. The Examiner essentially takes the position that MENNIG teaches a process of the type recited in the rejected claims, which process comprises a two-stage thermal densification of a coating applied to a substrate. The rejection concedes that MENNIG “is silent as to specific conventional drying conditions”, wherefore MENNIG “does not explicitly teach wherein the drying process is conducted in an oxygen-containing environment”. In this regard, the rejection alleges that HENCH cures the noted deficiency of MENNIG by allegedly disclosing corresponding drying conditions.

Applicants respectfully traverse this rejection. In particular, it is pointed out that the rejected and present claims are drawn to a process which comprises a two-stage thermal densification. In contrast and as correctly noted by the Examiner, MENNIG discloses a process which comprises a drying step and a (one-stage) thermal densification step. While a drying step is also contemplated by the present invention (see, e.g., page 15, lines 9-13 and page 17, lines 3-6 of the present specification as well as claims 53 and 56-58 submitted herewith), this drying step is not performed as a part of, but performed in addition to, the two-stage thermal (heat-treatment) densification recited in the instant independent claims.

In this regard, it is noted that one of ordinary skill in the art is aware that a drying operation and a (thermal) densification operation are different from one another. In particular, the drying step relates to the conventional removal of a solvent to obtain a dry (and usually porous) coating, whereas a densification results in a densified (vitreous) layer.

The clear distinction between drying and densification is also apparent from the documents relied on by the Examiner. For example, according to col. 4, lines 15-19 of MENNIG, “[p]rior to said thermal densification a conventional drying operation of the coating composition ... will usually be carried out”. In this regard, see also Example 4 and in particular, col. 6, lines 36-45 of MENNIG, which illustrates a corresponding procedure.

Likewise, HENCH teaches in col. 2, lines 57-60: “For the purposes of this discussion, the sol-gel technique will be viewed as comprising six basic steps, (1) mixing the sol ... (5) drying the gel, and (6) densification of the gel.” See also col. 4, lines 12-45 and col. 5, lines 62-68 of HENCH in this regard.

By way of further explanation of the difference between drying and thermal densification Applicants submit that in general, when preparing a coating by applying a coating composition to a substrate a gel film (wet gel) is obtained on the substrate. This gel film usually contains residual solvent. If the gel film contains solvent, a drying step is almost always necessary before a densification can be effected. During the drying operation, the solvent will be substantially removed by evaporation to obtain a dried gel (usually porous, also called xerogel). In the densification step the dried gel film is densified. According to the present invention, the densification is carried out in two stages. The first densification stage is designed for the thermal removal of organic residues, e.g.,

organic residues contained in the coating precursors (see, e.g., p. 6, lines 1-14 of the present specification), coating additives and also remaining traces of solvents. In the second densification stage the densification is completed (see, e.g., page 3, line 34 to page 4, line 23 of the present specification).

Heating of the gel film required for densification is only possible if the gel does not contain significant amounts of solvent. Similarly, heating of a solution of sugar in water will first result in the evaporation of water. Only after the water has been substantially removed, i.e., the sugar is substantially dry, will it be possible to melt the sugar by heating it to its melting temperature.

As pointed out above, one of ordinary skill in the art is aware that there is no relationship between the conditions for drying and the conditions for thermal densification. MENNIG describes a drying step followed by a densification step. HENCH discloses conditions which may be useful for the drying step of the process taught by MENNIG, but does not provide any helpful information regarding the densification step, let alone teaches or suggests carrying out the densification step of MENNIG as a two-stage operation.

Applicants further note that two of the inventors of the present application are also inventors of MENNIG. The drawbacks of the process of MENNIG (which claims priority from DE 1974949 cited in the present specification) and other known processes are discussed in detail in the passage from page 1, line 36 to page 3, line 16 of the present specification. In particular, the coatings obtained by the known processes (which include a one-stage densification) exhibit discoloration, sensitivity to boiling water and minor flexibility so that they are not suitable for cold deformation operations (page 2, lines 20-39 of the present specification). The Examples of the present

application demonstrate that the process of the present invention is capable of affording coatings which exhibit an improved color appearance and an improved hot water resistance and are cold-deformable up to a two-dimensional radius of 5 mm (page 17, lines 18-26 of the present specification).

Applicants submit that for at least all of the foregoing reasons, MENNIG in view of HENCH is unable to render obvious the subject matter of any of the present claims, wherefore withdrawal of the rejection under 35 U.S.C. § 103(a) over these documents is warranted and respectfully requested.

Response to Remaining Rejections under 35 U.S.C. § 103(a)

Claims 33 and 34 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of HENCH and further in view of the content from MCGILL. Claim 38 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MENNIG in view of HENCH and further in view of CHOU.

Applicants note that the rejected claims are cancelled, wherefore this rejection is moot. Applicants further note that claims 33, 34 and 38 (and the instant claims corresponding thereto) are dependent claims and are not rendered obvious for at least all of the reasons which are set forth above with respect to the independent claim(s) from which they depend. MCGILL and CHOU clearly fail to cure the noted deficiencies of MENNIG and CHOU, wherefore Applicants refrain from specifically commenting on the allegations with respect to MCGILL and CHOU which are set

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forth in the present Office Action, without admitting, however, that any of these allegations is meritorious.

CONCLUSION

In view of the foregoing, it is believed that all of the claims in this application are in condition for allowance, which action is respectfully requested. If any issues yet remain which can be resolved by a telephone conference, the Examiner is respectfully invited to contact the undersigned at the telephone number below.

Respectfully submitted,
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/Heribert F. Muensterer/

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